Drawing for young children, by Mr. E. B. Sargant. The author said it was well recognised at the present day that the old plan of beginning to teach drawing by making the children produce a series of straight lines tended to disgust young children with the subject for their whole school life. It was much easier to draw circles than straight lines, as appeared natural if the mechanism of the arm was considered. It was also better to begin with drawing rather than with writing, and to practise from the shoulder at first, then from the elbow, and finally from the wrist and fingers. This plan prevented the straining of the eyes at a time when short sight was likely to be produced very early. There was also a great deal to be said for beginning with the brush and colour rather than with the pencil or chalk. Mr. Sargant then proceeded to consider in detail the code of the Orange River Colony, which gave effect in drawing to these principles.

General Business.

At a council meeting of the association on April 4, Sir Charles Metcalfe, the president, alluded to the visit of the British Association to Johannesburg next year, and said he had been in frequent correspondence with members of the committee which had been appointed in England, including Sir Norman Lockyer and Prof. Dewar. Everything is now settled except the route, the fixing of which it has been considered better to postpone until nearer the date. There is also the question as to who should be president for the year, and though this has not been decided yet, there was no doubt there would be a very good president coming out for the meetings. The greatest man of science of the day, Lord Kelvin, who would be eighty-one years of age next year, was resolved to come. With regard to the status of members of the South African Association, they would naturally be entitled to attend all the meetings of the British Association. The proposal was that there should be three days' meetings at Cape Town and three days' meetings at Johannesburg, with shorter sessions at Durban, Kimberley, Bulawayo, and other places visited.

Sir Charles Metcalfe also referred to the arrangements to be made in connection with the visit of the British Association at the annual business meeting of the South African Association. Certain local papers will be read, and these will be chosen by the local committees of the places where meetings are held, so that those who come from distances may have the opportunity of hearing a good paper dealing with the chief object of interest in that particular centre.

THE NEW ZEALAND VEGETABLE CATERPILLAR.

FEW among the smaller natural productions of New Zealand have attracted more attention than the so-called vegetable caterpillar of New Zealand, of which we have just received a very fine specimen from Messrs. Armbrecht, Nelson and Co., of Duke Street, Grosvenor Square, W. Fungoid parasites are sufficiently common in all parts of the world, but are not generally conspicuous enough to be much noticed by any persons but naturalists. Many of the largest and most remarkable moths of the Australian region belong to the families Cossidæ and Hepialidæ, represented in Europe by our goat moth and swifts, and the caterpillars of several species of these are known to be infested by various parasitic fungi belonging to the genus Cordyceps, Fries, which convert the whole substance of the caterpillar into a woody substance, and then sprout from it to a length of several inches.

As in the case of larvæ attacked by insect parasites, these (which are usually about four inches long when full grown) live until they are ready to assume the pupa state, when they bury themselves in the ground, die, and the fungus sprouts upwards, generally from the neck of the caterpillar, sometimes acquiring the length of nearly a foot, and sprouting up from the ground above the caterpillar. Very rarely two, or even three, of these filaments may sprout from a single caterpillar. The best known species is *Cordyceps Hugelii*, Corda (*Sphaeria Robertsii*, Hooker), which is extremely abundant in New Zealand.

"The New Zealander's name for this plant-caterpillar is Hotete, Aweto, Weri, and Anuhe. The natives eat the plants, which when fresh have the flavour of a nut, and also use them, when burnt, as colouring matter for their tattooing, rubbing the powder into the wounds, in which state it has a strong animal smell" (Gray, "Notices of Insects that are Known to Form the Bases of Fungoid Parasites" (1858), p. 6, note quoting from Taylor). Almost every writer in New Zealand has discussed the vegetable caterpillar in more or less detail, notably Taylor and Hochstetter, in addition to Gray's important paper quoted above. Mr. G. Massee's "Revision of the Genus Cordyceps" (*Annals of Botany*, vol. ix. pp. 1–44, pls. i. and ii., March, 1895) may also be consulted.

It is probable that more than one species of New Zealand caterpillar is infested by, perhaps, more than one species of Cordyceps. *C. Hugelii* (*Robertsii*) is usually said to be parasitic on the larva of the large green moth *Hepialus* (*Œnetus*) *virescens*, Doubleday, but Mr. G. V. Hudson points out in his "New Zealand Moths and Butterflies" (p. 132) that this cannot be the case, because the larva of that insect burrows in the wood of trees, and forms its pupa in the galleries, and not in the ground. He suggests that it may infest the larva of *Porina Mairi*, Buller, a brown moth with black and white spots and markings; but this seems equally improbable, for this is a very rare moth, of which very little seems to be known. More information on these curious parasites and their hosts is very desirable.

W. F. KIRBY.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—A meeting of the University Junior Scientific Club was held on May 4. Mr. H. B. Hartley exhibited an unpublished portrait of Sir Richard Owen. Mr. A. S. MacNalty read a paper on William Harvey.

The eleventh Robert Boyle lecture will be delivered on June 3 in Balliol College Hall by Prof. J. J. Thomson, F.R.S. His subject will be "The Structure of the Atom."

The Romanes lecture will be delivered by Sir Courtenay Peregrine Ilbert, K.C.S.I., Balliol College, on Saturday, June 4, at 3 p.m., in the Sheldonian Theatre. The subject of his discourse will be "Montesquieu."

A meeting was held in the schools on Friday, May 6, to discuss the question of the organisation of post-graduate study. The president of Trinity was in the chair. The meeting was largely attended by those who are interested in the encouragement of research. Prof. Poulton moved a resolution advocating the expediency of "the further utilisation of fellowships for the purposes of research." This was seconded by Profs. Ellis and Gardner, and carried unanimously. Dr. Farnell moved a resolution favouring "the better organisation of the teaching resources of Oxford." He wished to see the boards of faculty take a more active part in organising the teaching resources, which now suffer from considerable dislocation. The boards ought to be able to give the status of professor to a college tutor, and assign him an income from university funds. The general principle of Dr. Farnell's resolution was carried.

CAMBRIDGE.—Sir Michael Foster has been re-appointed a manager of the Balfour (Animal Morphology) Fund.

Applications for leave to occupy the university tables at the Naples and Plymouth Zoological Stations are to be sent to Dr. Harmer, King's College, by May 26.

Mr. Frank G. Smart, M.B., has generously endowed a university studentship for research in botany of the value of 100*l.* a year for two years. The first election will be made in July.

The Board of Agricultural Studies reports the continued progress of the department, which last term had forty students. A number of field experiments have been instituted, and are in progress on the university farm and in the adjoining counties, under the supervision of Prof. Middleton and his staff.

THE Drapers' Company has decided to grant 15,500*l.* to the University College of South Wales for the purpose of erecting the structure of the proposed new library, in lieu of 10,000*l.* conditionally granted in 1895.

IT is announced in *Science* that at the recent Convocation of the University of Chicago, President Harper acknowledged a gift of 1000*l.* for special investigation in the department of physics, by the president of the board of trustees, Mr. Martin A. Ryerson, and a gift of 2000*l.* by Miss Helen Snow as a memorial to George W. Snow, her father, to rebuild the horizontal telescope at Yerkes Observatory, which was injured by fire.

AMONG the many educational enterprises of the Lancashire County Council, the system of technical instruction for fishermen, which is being much appreciated by the fishermen along the Lancashire coast, deserves special comment. The county council has arranged for batches of fifteen fishermen at a time to attend at the Piel (Barrow) Hatchery and Marine Laboratory to be instructed in the habits and conditions of breeding of various kinds of fish. The course lasts a fortnight, during which time the fishermen reside at Piel. The county council allows each man 5*l.* towards his expenses. We have received from Prof. W. A. Herdman, F.R.S., a copy of the syllabus of the lessons in marine biology given in these practical classes, and it shows that in addition to an introductory course, time is found for the fishermen to dissect and study the mussel, shrimp, crab, cockle, oyster, and fish parasites, and also to become acquainted with the leading facts about the breeding of these and other forms of life. Such courses of work as these must be of great value to fishermen.

IN his presidential address to the British Association last year, Sir Norman Lockyer used the two-power principle by which our naval expenditure is determined to illustrate and emphasise his appeal for State aid for universities equivalent to any two nations commercially competing with us. Recognising that universities are the chief producers of brain-power, and therefore the equivalents of battleships in relation to sea-power, examination was made of the provision for university education in Germany and the United States and that existing in this country. The result showed clearly that "instead of having universities equalling in number those of two of our chief competitors together, they are by no means equal to those of either of them singly." In connection with this comparison, it is of interest to notice that in answer to a question asked in the House of Commons last week, the average annual cost of maintaining in commission a first-class battleship of about 13,000 tons was stated to be, in round numbers, 94,000*l.* The State contribution to the whole of our universities and colleges amounts to about 156,000*l.* a year, that is, less than the sum required to keep two battleships in commission.

IN a dedication address at the opening of Palmer Hall, Colorado, Prof. S. Lawrence Bigelow dealt with the growth and function of the modern laboratory. The address is printed in *Science* of April 22. Eighty years ago, said Prof. Bigelow, there was not, in any country, a single laboratory for the purpose of teaching chemistry, though, of course, the subject had been taught for many years by means of lectures forming a recognised part of a medical course. To Liebig, at Giessen, belongs the credit of establishing the first chemical laboratory ever opened to students in a university. This was soon after 1824, the year in which he began his work at Giessen. So far as the foundation of laboratories in America is concerned, the address states that chemistry was taught in the laboratory in the medical department of Harvard University at an early date, and in 1846 a new medical school was built, the basement of which was devoted to a chemical laboratory capable of accommodating 138 students. At Yale Prof. B. Silliman and his son established a laboratory of analytical chemistry, and it became of sufficient importance to be incorporated as part of the university in 1847. The University of Michigan is generally recognised as being the first to introduce the laboratory method in teaching. A building exclusively for the teaching of chemistry was finished in this university at a cost of 1200*l.*, including the equipment, and was in use in 1856. But, as Prof. Bigelow remarked, it would be harder to find a university without moderately good laboratories to-day than it was to find one with them in 1850. The concluding sentences of the address will appeal to all men of science:—"Our laboratories have overwhelmingly justified their cost by their past history, and are justified in making greater demands than ever, by the importance of the functions which they fulfil. It is to be hoped that philanthropists will be still more liberal than they have been, and that the people will tax themselves more than they ever have, through their legislatures, to give to all schools, colleges and universities. Such money is the fire insurance and the life insurance of society as a whole, guaranteeing the maintenance of law and order, and the ability of the next generation to support the burden of advancing civilisation, when its turn comes."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 25.—"On the Compressibility of Solids." By J. Y. **Buchanan**, F.R.S.

The solids dealt with in this research are the metals platinum, gold, copper, aluminium, and magnesium. Their absolute linear compressibilities were directly determined at pressures of from 200–300 atmospheres at temperatures between 7° and 11° C. The determinations were made by the same method, and with the same instrument which the author used for the determination of the compressibility of glass in 1880 (Roy. Soc. Edin. *Trans.*, vol. xxxix. p. 589).

The instrument consists essentially of a powerful force pump and a tubular receiver to take the samples of metals to be experimented on. These must have the form of rod or wire. The steel tube which forms the receiver has a length of 75 inches and an internal diameter of 5/16 inch. It is closed at each end by thick glass tubes having a bore of between one and two millimetres. In the present investigation the metals were all used in the form of wire (No. 22 S.W.G.). Inside the steel tube they are supported in an axial position by an internal concentric tube, and their ends project into, and are visible through, the glass terminals. Each glass terminal is commanded by a microscope with micrometer eye-piece and standing on a substantial platform, altogether independent of the rest of the apparatus. When the wire is properly placed in the receiver and the microscopes are in position, the pressure is raised to the desired height, as indicated by the manometer, and the ends of the wire are observed and their positions with reference to the micrometers noted. The pressure is then carefully relieved, and a displacement of both ends is seen to take place and its amplitude is measured. The sum of the displacements of the ends, regard being had to their signs, gives the absolute expansion of the wire in the direction of its length, when the pressure on its surface is reduced by the observed amount, and consequently also the compression when the process is reversed. From this the linear compressibility is at once obtained. If the mass of the wire be isotropic, then its cubic compressibility is obtained by multiplying the linear compressibility by three. The wires used were all well annealed before the experiment, with the exception of the magnesium.

In order to bring the ends into a suitable position for observation with the microscopes, the length of the wire had to be between 75 and 75·5 inches. The actual length was measured exactly in each case, and it averaged 75·32 inches (1·913 metres).

The manometer which indicates the pressure in the instrument is simply a mercurial thermometer with a very thick bulb. The scale on it is an arbitrary one, and its value as a measure of pressure is fixed by observing its reading in comparison with the principal piezometer which was used by the author during the voyage of the *Challenger*. The standard of pressure is therefore an open-air column of sea-water of known properties. The micrometers in the eye-pieces of the microscopes were standardised by reference to a stage micrometer which was verified at the National Physical Laboratory. Their values were very nearly equal, with the powers used. One division in the eye-piece corresponded to 0·000422 and 0·000417 inch respectively on the stage, or to about 1/180000 of the length of the wire.

In the paper the results for each metal are given in a separate table. It will be sufficient to reproduce the summary, Table I. In it the compressibilities of English